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Title:	Long-Term Monitoring & Stewardship at Los Alamos National Laboratory
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Long-Term Monitoring & Stewardship at Los Alamos National Laboratory

Environmental Protection and Compliance Division

Compliance Programs

Strategy

Development and implementation of the Institutional Control Evaluation Project;

- Evaluate institutional surface water controls and infrastructure installed by LANL.
- Implement pilot project in the Los Alamos Canyon Watershed Spring, 2020.
  - Initial evaluations will include canyon bottom controls
  - Expand program as funding allows
- Building block for successful Long-Term Monitoring and Stewardship (LTM&S) Program.

Examples of Institutional Controls



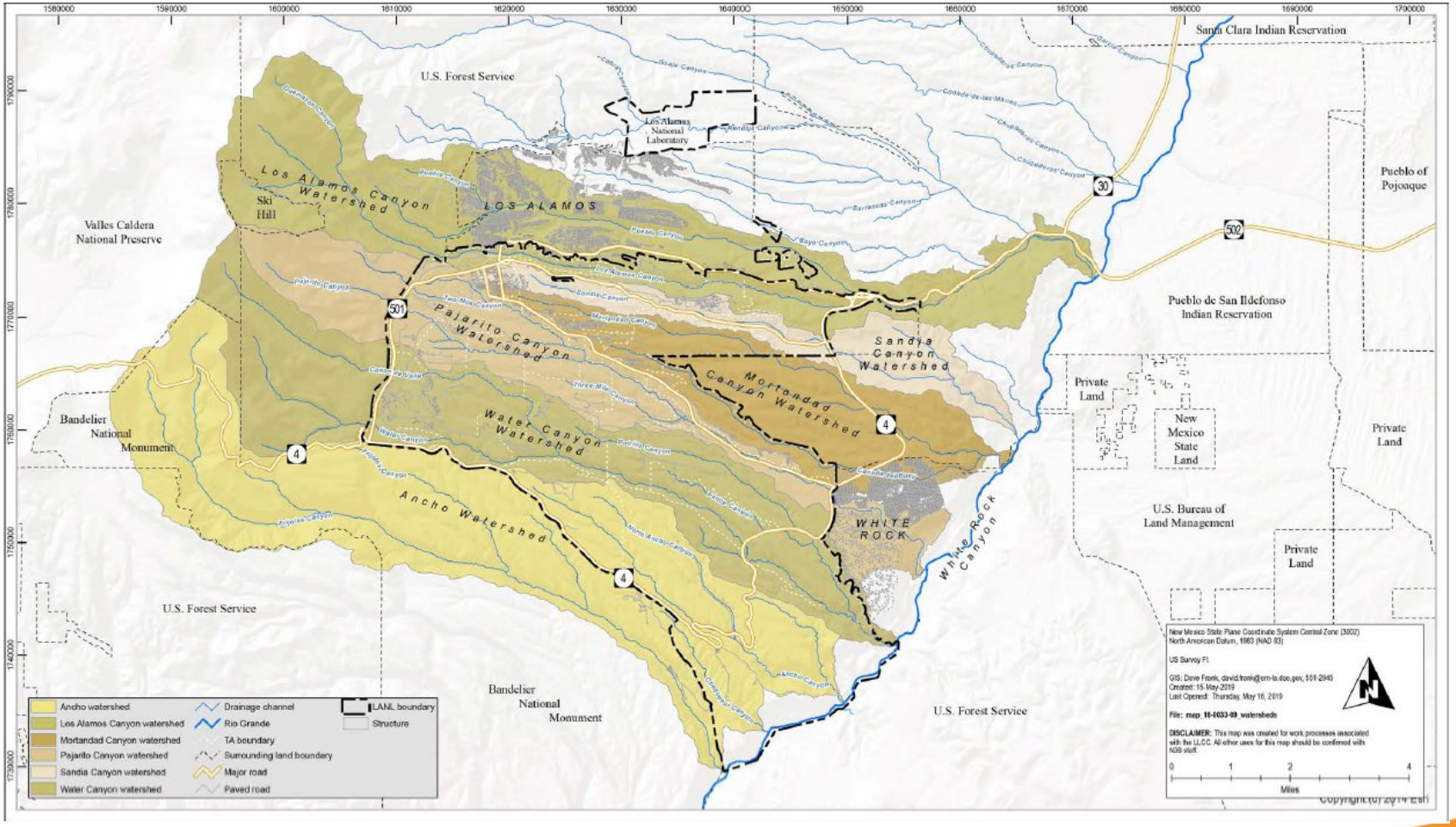



Institutional Control Evaluation Project Objectives

LANL currently does not have a reliable inventory of institutional surface water controls and infrastructure (ponds, flood control, sediment control, etc.) located throughout the Laboratory on mesa tops and canyon bottoms. Mechanisms are being developed to ensure controls are:

- Effective and functional;
- Properly maintained, inventoried, and routinely evaluated;
- Modified as necessary to reflect changes in condition, needs or technological advancements;
- Protective of cultural resources and threatened and endangered species;
- Prevent/limit inadvertent human and environmental exposure to residual contaminants;
- Identified as Real Property and placement on the Master Equipment List (MEL) if applicable.

LANL Watersheds



Institutional Control Evaluation – Los Alamos Canyon Watershed Pilot Project

The Los Alamos Canyon Watershed encompasses both Los Alamos County and DOE property, has a wide variety of LANL installed controls managed by Triad and N3B, and will be the center of the Institutional Control Pilot Project. The pilot project will focus on canyon controls and be managed and executed in the following 3 phases:

Phase 1: Planning and Aspects Identification

- List of known controls
- Evaluation criteria
- Planning and procedures

Phase 2: Evaluation and Assessment

- Site visit, photograph and evaluation of controls
- Collection of GPS coordinates
- Collection of evaluation criteria

Phase 3: Data Management

- GIS and database
- Reporting

Phase 1

Planning and Aspects Identification

- List of known canyon bottom controls in the Los Alamos Watershed
  - *6 Canyons: 25+ controls to be evaluated for established criteria*
- Evaluation criteria
  - *Can control be located,*
  - *owning agency,*
  - *asset type, is it functional, is it required, etc.*
- Planning and procedures
  - *Pilot Project Plan for Institutional Control Evaluations*
  - *EPC-CP-AP-2302 Institutional Control Evaluations*

Phase 2

Evaluation and Assessment

- Site visit, photograph and evaluation of controls
  - *Photograph to document state of control*
  - *Evaluation will include: general condition, evidence of erosion, structural integrity, vegetation / debris accumulation, and sediment control*
- Collection of GPS coordinates
  - *Coordinates of location will be collected, with area / length if necessary*
- Completion of evaluation form
  - *Electronic evaluation form completed on GPS unit or other electronic device*
  - *Evaluation will sync with database without the need for manual entry*

Phase 3

Data Management

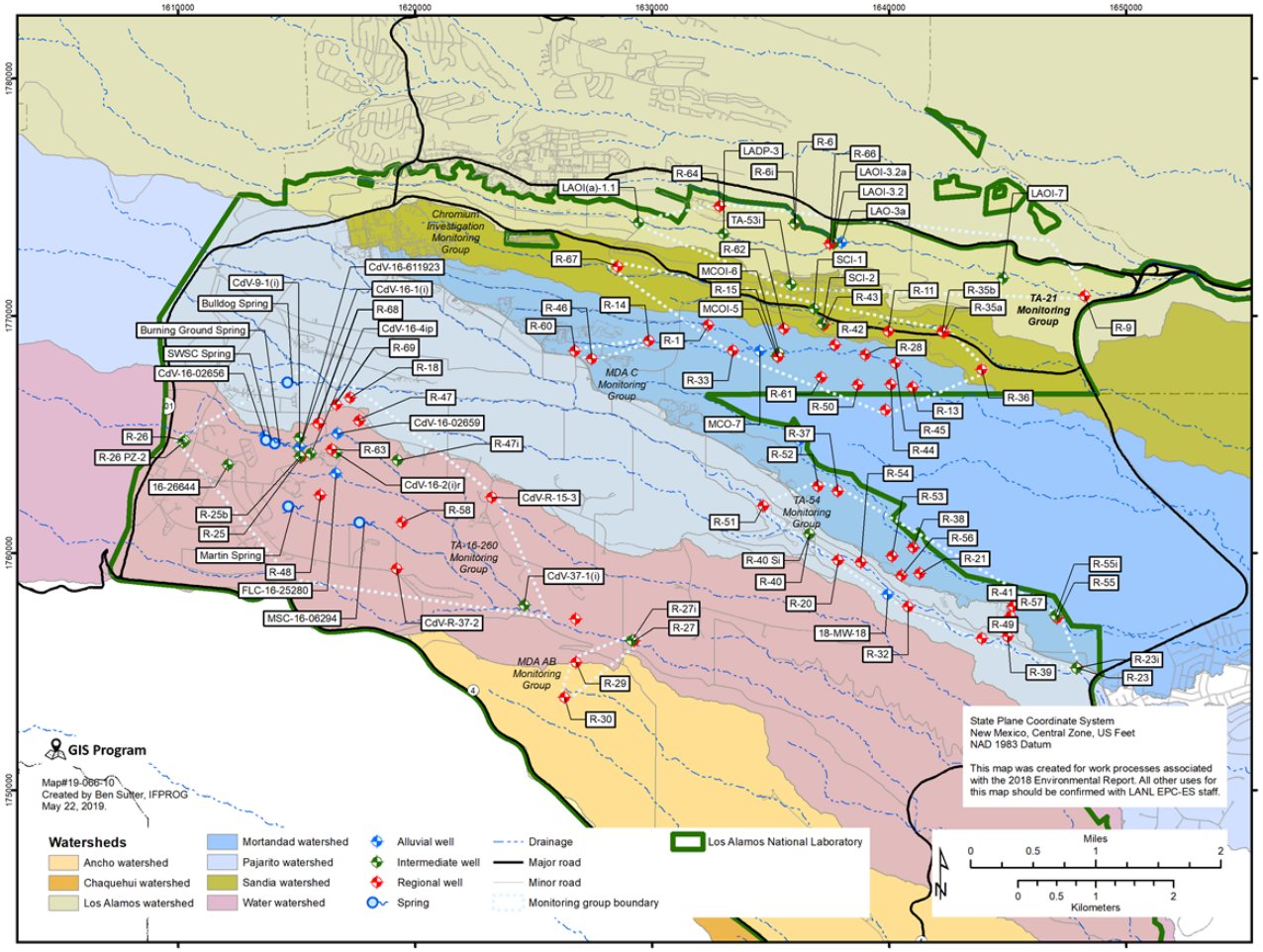
- GIS and database
  - *GPS unit (Lecia Zeno 20) will support data collection*
  - *Web-based application is in development to complete evaluation and collect attribute data in the field*
  - *GIS database is in development to house GPS and attribute data*
  - *Database will have the capability to manage project status, inspection needs and frequency, work needed, spatial analysis, as well as generate maps, summary tables, and support reporting needs*
- Reporting
  - *Evaluation of findings and recommendations*
  - *Mapping layer updates*
  - *Future LTM&S program development*

Take Away Message

The LTM&S Program will be the lead for the inspection, monitoring, and maintenance of established long term environmental controls associated with Laboratory historic, current and future operations.

A. Initial phase of the LTM&S program, Institutional Controls, is underway.
B. Will be used as a guide for the development of future phases that will include:
   - *Firing Sites*
   - *GroundWater Monitoring (Springs &Wells)*
   - *Surface Water Gage Stations*
   - *Buckman Critical Flumes and Gages (Santa Fe DrinkingWater Supply)*
   - *EM Consent Order Deferred and Long Term Stewardship Sites*
C. Collaboration with the Field Office will be ongoing to look for opportunities to engage the Four Accord Pueblos in performance of activities.
D. Growth of the Program will require personnel and funding as requirements are defined and phases added.

Groundwater monitoring wells and springs assigned to area-specific monitoring groups for IFGMP sampling



Groundwater Monitoring Infrastructure

- Retention of key monitoring wells for long-term monitoring to meet the requirements of:
  - RCRA Permit FGMP (40 CFR 264.90 – 264.100)
  - Discharge Permits (DP 1132, DP 857)
- Require inspection and maintenance:
  - Borehole inspection and maintenance dependent on well type and downhole equipment.
  - Site conditions include wellhead integrity, physical security, proper labeling, protective bollard condition, well pad, and access road serviceability.

R-16 Monitoring Well Details

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	APV Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Packer/Sump Bottom (ft)	Packer Bottom Depth (ft)	Bottom of Sump Elev (ft)	Sump Length (ft)	Hydro Zone Code	Geo Unit Code	Comment
1	641.0	648.6	5615.9	5608.3	7.6	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	RT	Tp	Screen unusable
2	863.4	870.9	5393.5	5386.0	7.6	872.8	5384.1	870.9	5386.0	881.2	886.6	5376.6	10.3	RD	Tbf	Upper zone
3	1014.8	1022.4	5242.1	5234.5	7.6	N/A	NA	N/A	N/A	N/A	N/A	N/A	N/A	RD	Tbf	Screen sealed off
4	1237.0	1244.6	5019.9	5012.3	7.6	1234.6	5022.3	1244.6	5012.3	1276.7	1223.0	4980.2	32.1	RD	Tbf	Lower zone

R-16 Construction Information

Brass Cap Elevation: 6256.87 ft; all measurements are from this elevation

MAINTENANCE, INSPECTION, CALIBRATION HISTORY

DATE	COMPONENTS/SYSTEM	SERIAL NUMBER	WORK PERFORMED
	Grundfos submersible		
Aug 2013	Level TROLL 500 500psi	350033	In-Situ transducer measuring packer pressure.
Sep 2009	Level TROLL 500 30 psi	150543	In-Situ transducer measuring screen 2 pressure.
Sep 2009	Level TROLL 500 100 psi	151851	In-Situ transducer measuring screen 4 pressure.

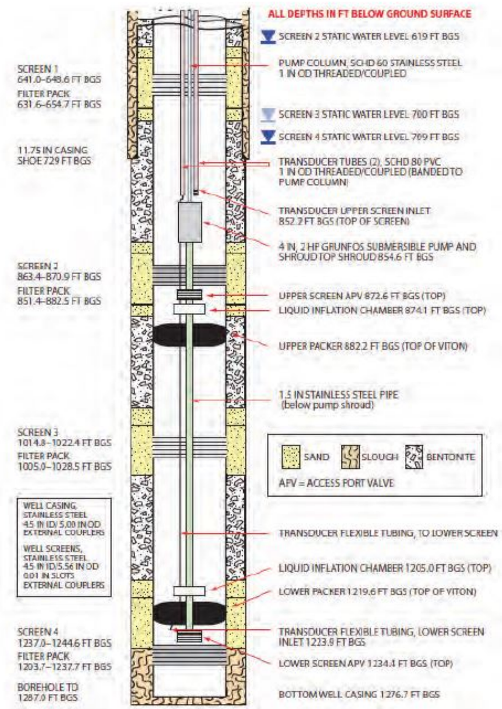
VIDEO/GEOPHYSICS LOGGING HISTORY

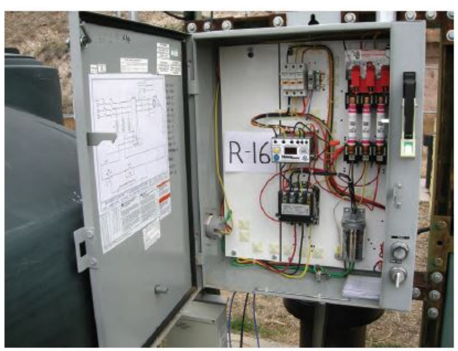
DATE	RUN DEPTHS	PURPOSE
Aug 2002	0' – 117'	Video log open hole, bridged at 117'
Aug 2002	0' – 1287'	Schlumberger – AITH, FMI, TLD, NGS, ECS, CNTG, GR, Sonic caliper
Aug 2002	0' – 1287'	LANL GR
Nov 2002	0' – 1276.7'	LANL video as-built prior to Westbay installation
Aug 2006	0' – 1272.1'	LANL video prior to well conversion

DOCUMENT/DRAWING REFERENCES

DATE	LA-UR #	TITLE
Jun 2003	LA-UR-03-1841	Characterization Well R-16 Completion Report
Jan 2007		Final Rehabilitation Report for Regional Wells R-20 and R-16
Sep 2009	LA-UR-09-5372	Rehabilitation and Conversion Summary Report for Well R-16

NOTE: Components to include sample system, packers, transducers, telemetry, and well rehabilitation efforts.





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Drafted by: M. Laemmle Checked by: S. Pearson Date: June 2016	General Surveillance Monitoring Group	

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LTS Groundwater Monitoring Regulatory Requirements

- RCRA Permit Facility Groundwater Monitoring Program (FGMP)
  - 40 CFR 264.90 through 264.100
- As long as Consent Order is in effect, groundwater monitoring requirements fulfill the requirements of the FGMP
- Consent Order coordination - monitoring requirements will eventually transition back to NNSA
  - Challenge will be how to manage individual well monitoring requirements during a multi-year transition

Questions and Needs

- Definition of Real Property. Ensure criteria is captured in evaluation. What can we do to assist in determinations?
- Feedback on evaluation criteria and data collection. Are we missing something?
- Planning to evaluate and collect data at EM controlled sites for future transfer needs and requirements. Acceptable?
- Expand reviews to include mesa top controls within the Pilot Project?
- Future meeting topics?